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NORTH AMERICAN PHILIPS CORPORATION

EXECUTIVE OFFICES

July 17, 1989

Mr. Kenneth Theisen
U.S. Environmental Protection Agency
(ENGINUITY INC)
501 East State Street
Albany, IN 47302

Re: Selmer Company
Elkhart, Indiana

Dear Mr. Theisen:

In our conversation of July 6, 1989, we discussed information upon which you based your statement that the U. S. Geological Survey Water-Resources Investigation 81-53 contained information essential to both characterizing the industrial park contaminant plume and by reference, associated the Selmer/Bach Plant, located at 500 Industrial Drive, with that plume.

Subsequent to that phone conversation I reviewed this Government report once again. This inspection, as with my previous reviews gave no indication that this facility can be connected with any known contamination in the area.

I am enclosing a summary of the relevant portions of the USGS report. The summary indicates the following:

-the authors were unable to identify the source(s) of contamination in the area. There is even a possibility that it does not emanate from the industrial park.

-water samples taken on two occasions from a Government groundwater well installed on the Selmer property, in a downgradient position showed that there were no volatile organic compounds present in the water. Samples taken north of the many industrial facilities located on the north side of Industrial Drive and the Conrail tracks show high levels of contamination. Therefore, it seems obvious that the given groundwater contamination originated from one or more of these facilities and/or from activities in or around the Conrail tracks.

-the statement that groundwater flows to the northwest is not entirely accurate. The groundwater flows to the northwest as it flows through the industrial park. At the perimeter, the flow appears to change to a westward direction because the St. Joseph River is dammed, and becomes a loosing stream because of its relatively higher hydraulic head.

I would appreciate your timely review of this summary. If the EPA is in possession of any additional information regarding Selmer's alleged connection with the contaminant plumes, I would appreciate it if you would advise me.

Sincerely,

Ann C. Pizzorusso
Director
Environmental Affairs

cc: R. Fields
J. Kelly
C. McKinley
F. Philips

The following is a brief summary of the United States Geological Survey Water-Resources Investigation 81-53 by Thomas E. Imbrigiotta and Angel Martin, Jr. and how it relates to the Vincent Bach Division of the Selmer Company at 500 Industrial Parkway, Elkhart, IN.

This USGS investigation was a three year study initiated in order to:

1) determine the general flow and quality of groundwater in the outwash aquifer system of the area,

2) determine if a proposed well field at the Elkhart Municipal Airport would draw leachate from the Himco Landfill both located northwest of Elkhart, and the hydrologic effects of the proposed groundwater pumping on the local groundwater system. (Figure 1) and,

3) define the areal extent of the groundwater affected by the landfill and the industrial park in eastern Elkhart.

The first and third of these objectives relate to present investigations at the Vincent Bach/Selmer Company, and are included in the Part 1 and Part 2 of the study respectively. The applicable data and conclusions are summarized herein. In addition, comments are included demonstrating whether or not the Water-Resources Investigation is adequate in defining groundwater flow direction at the Selmer Plant.

Hydrologic Characteristics of the Unconsolidated Deposits

Part 1 of the report deals with the groundwater investigation; its availability, and general groundwater hydrology.

It has been determined that the area is characterized by valley train outwash deposits. The sands and gravels form an extensive outwash aquifer. A layer of silt and clay averaging 20 feet (6.1 m) in thickness is interbedded with the sands and gravels, dividing the deposits into two aquifers, confining the deeper aquifer.

The hydraulic conductivities of the outwash materials were based on data collected during specific capacity tests of observation wells in the Himco Landfill area. (Figure 1) Hydraulic conductivities for the sands were determined to be 80 ft/d (2.82 X 10-2 cm/sec). They hydraulic conductivity for the sand and gravel material was determined to be 400 ft/d (0.1411 cm/sec). The USGS assumed that lateral hydraulic conductivity in the silt and clay confining layer to be 0.1 ft/d (3.53 X 10-5 cm/sec) and insignificant.

Groundwater Flow

One of the objectives of the study was to determine the general groundwater flow of northwest Elkhart County, by measuring and mapping groundwater levels in observation, domestic and industrial wells throughout the study area. Figure 11 is the water level map for the unconfined aquifer using May 1979 data. The researchers found that water levels fluctuate from 2 to 4 ft per year, with the highest levels recorded in later March and April and the lowest levels in September and October.

Equipotential lines were drawn to show contours of equal elevation. Groundwater flow is perpendicular to these equi-potential lines were drawn to show contours of equal elevation. Groundwater flow is perpendicular to these equipotential lines and generally towards the St. Joseph River. The Water-Resources Investigation indicates that this flow pattern is characteristic of a well-connected stream-aquifer system with a gaining stream.

In areas near the river, upward gradients of greater than 5 feet were determined to indicate that groundwater discharges to the river. On the other hand, there is an anomaly at and near the hydroelectric dam where the water level is held unnaturally high, causing recharge of the aquifer by the river.

The USGS Report does not point out that this impoundment creates a groundwater mound. According to the USGS 1981 7.5 minute Quadrangle Topographic Map, the normal pool elevation of the St. Joseph River at the hydroelectric dam is 742.0 feet above mean sea level. This is at a higher potential than that of USGS observation well levels north of the industrial park. (Figure 45, Table I) Therefore, groundwater that flows northwest through the industrial park, does not necessarily continue to flow northwest until it discharges into the St. Joseph River. In fact, it is more than likely that groundwater from the industrial park discharges to the Elkhart River to the west rather than discharge into the St. Joseph to the north. Figure 45 gives the impression that groundwater flows northwest through the industrial park and continues northwest. However, upon closer examination of the 740 and 735 feet contours in Figure 11, groundwater flows west from the industrial park. This groundwater flow direction can be seen from the equipotential lines and flow direction arrows drawn perpendicular to the contours. (Figure 2).

Water-Quality Investigation

In the second part of the investigation, the general groundwater quality of northwest Elkhart County was evaluated and the areal extent of the effects of the industrial park on the local groundwater systems was determined.

In this part of the study, 104 of the 168 observation wells in the study area were sampled. Only the industrial park wells are of interest to ongoing investigations at the Vincent Bach/Selmer

Company Plant. (Figure 42).

In the industrial park, 24 wells, screened in the unconfined aquifer and less than 45 ft., were sampled at 22 sites in the area south of the St. Joseph River.

The observation wells were installed in the summer of 1978 and were sampled: September 1978, April 1979 and September 1979. The groundwater samples were then analyzed at the Geological Survey Laboratory in Doraville, Georgia. Sampling procedures, analytical techniques and QA/QC methods are included in the report.

The organic water quality of the industrial park area groundwater was determined by the USGS by analyzing for: acid-extractable (phenolic) compounds, base/neutral extractable organic compounds, and volatile organic compounds. The results from the volatile organic compounds detected are of considerable interest. Samples for determining these compounds were collected in April and September, 1979. Concentrations of the VOCs determined are in Table 11.

Eight (8) Volatile Organic Compounds were detected in eight (8) of the monitoring wells: 103, 104, 107, 108, 109, 112, 113 and 23S. (Figure 45) The highest average concentration for all organic compounds were detected in wells 104 and 109 on Grady Boulevard in the residential area north of the Conrail tracks. The average concentration of TCE in wells 104, 107, 112, and 113 exceeded the 200 ug/L (ppb) short-term maximum limit. The 20-ug/L (ppb) long-term limit was exceeded in at least one sample from six of the seven wells (104, 107, 108, 109C, 112, and 113), where TCE had been detected.

Note that well #111 on the northwest corner of the Selmer property was not one of the eight (8) wells determined by the USGS WRI to be contaminated by the 1979 testing. All volatile organic compounds screened were not determined in April 1979 and were below the detection limit in September 1979 for well #111. (Table 11)

There were several limitations to the results however. Approximately one-fourth of the samples collected from the same wells in both April and September 1979 had VOC concentrations that differed by an order of magnitude or more, while some VOCs detected in one set of samples were not detected in the next.

Differences were also noted from well 109 results where three monitoring wells were screened at the same depth and thirty (30) feet from each other. In addition, analytical recoveries detected from "spiking" samples with known concentrations of four of the VOCs, indicated that analytical variation could introduce as much as a 30% error in some results. Finally, losses of the volatile compounds during sampling and analysis were also determined to be responsible for variation in the results.

Despite these limitations, the fact remains that during the 1979 sampling of monitoring wells, TCE was not detected in well #111, closest in proximity to the Vincent Bach Division of the Selmer Company. In addition, wells 101, 105, 106, 114, and 115 west of Selmer were not determined to be contaminated with VOCs.

The USGS WRI did determine that the concentrations of TCE and 111-Trichloroethane, the two most widly distributed compounds, were disimilar in areal distribution. Martin and Imbrigiotta concluded that there are several reasons for this:

1) the source of the organic compounds is not within the industrial park;

2) the source is in the park, but north of the observation wells sampled; or

3) there is more than one source for the different organic compounds.

It was also determined that additional data would be needed in order to determine the sources of these compounds. And finally, the study was not able to accurately locate a source or delineate a plume of the detected organic compounds.

Conclusion

The Water-Resources Investigation accomplished its purpose in determining the general groundwater hydrology of northwest Elkhart County. However, this study is not site specific and does not define the groundwater flow in the Elkhart Industrial Park in detail, due to the use of a contour interval of five (5) feet. Furthermore, Figure 45 gives the impression that groundwater continues to flow northwest beyond the industrial park when this is not necessarily the situation.

The organic water quality of the Elkhart Industrial Park was also determined. Eight (8) volatile organic compounds were detected in eight (8) of the monitoring wells, however, well #111, on the northwest corner of Selmer Plant, was not one of these wells.

Finally, the study was not able to accurately locate a source or delineate a plume of the detected organic compounds with the data available at the time of the study.

LIST OF FIGURES AND TABLES

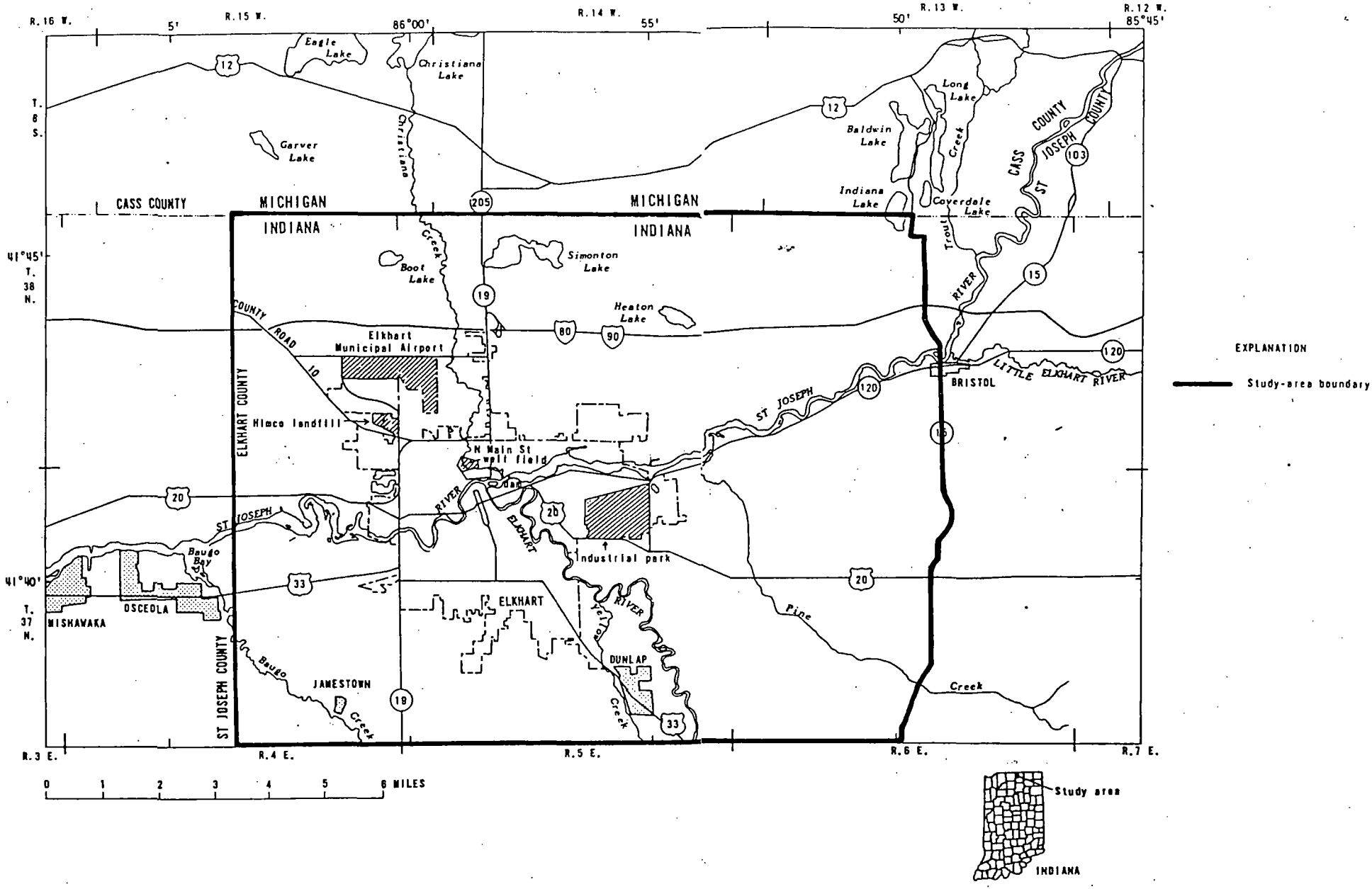


Figure 1.-- Study area in northwest Elkhart County, Ind.

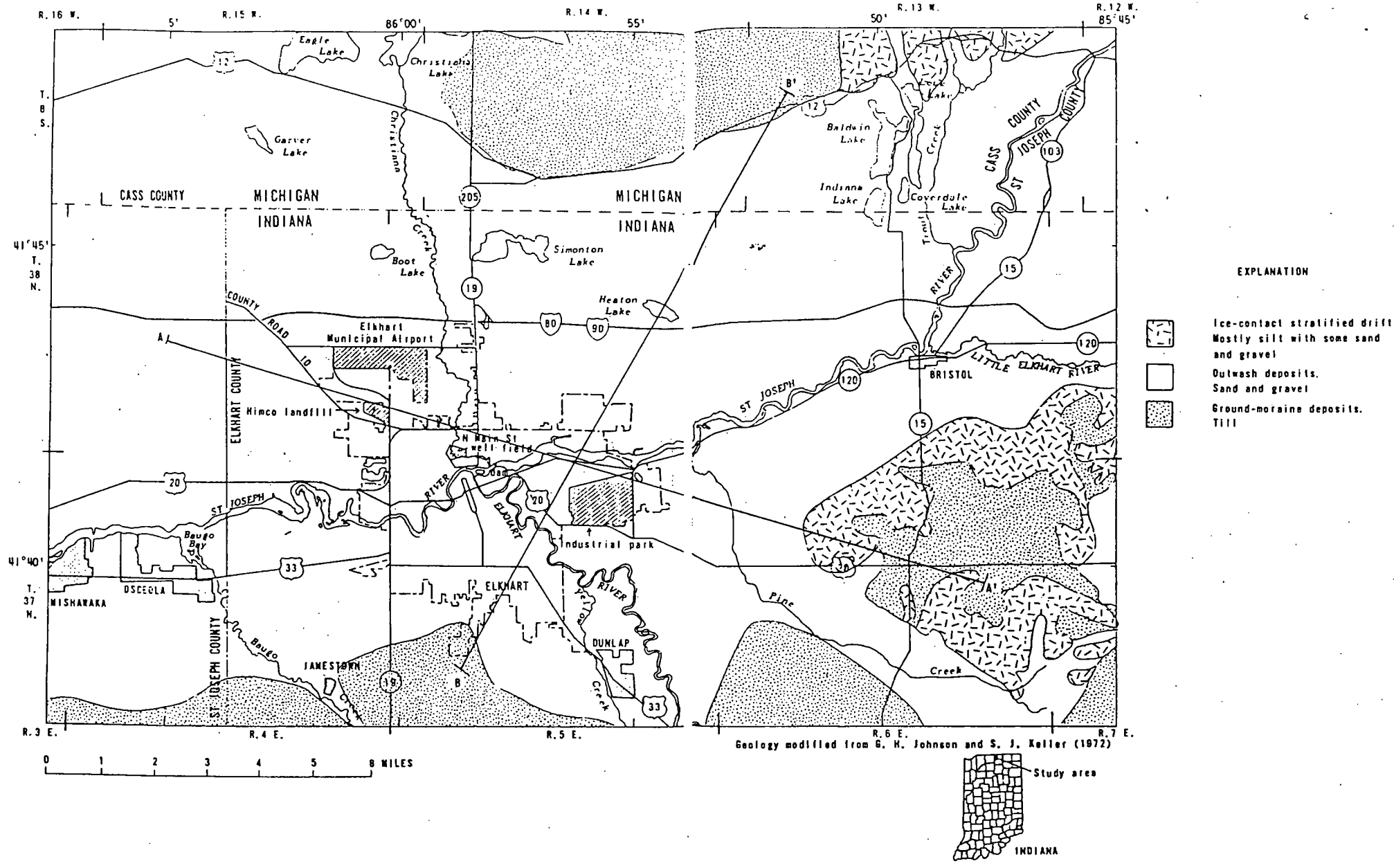
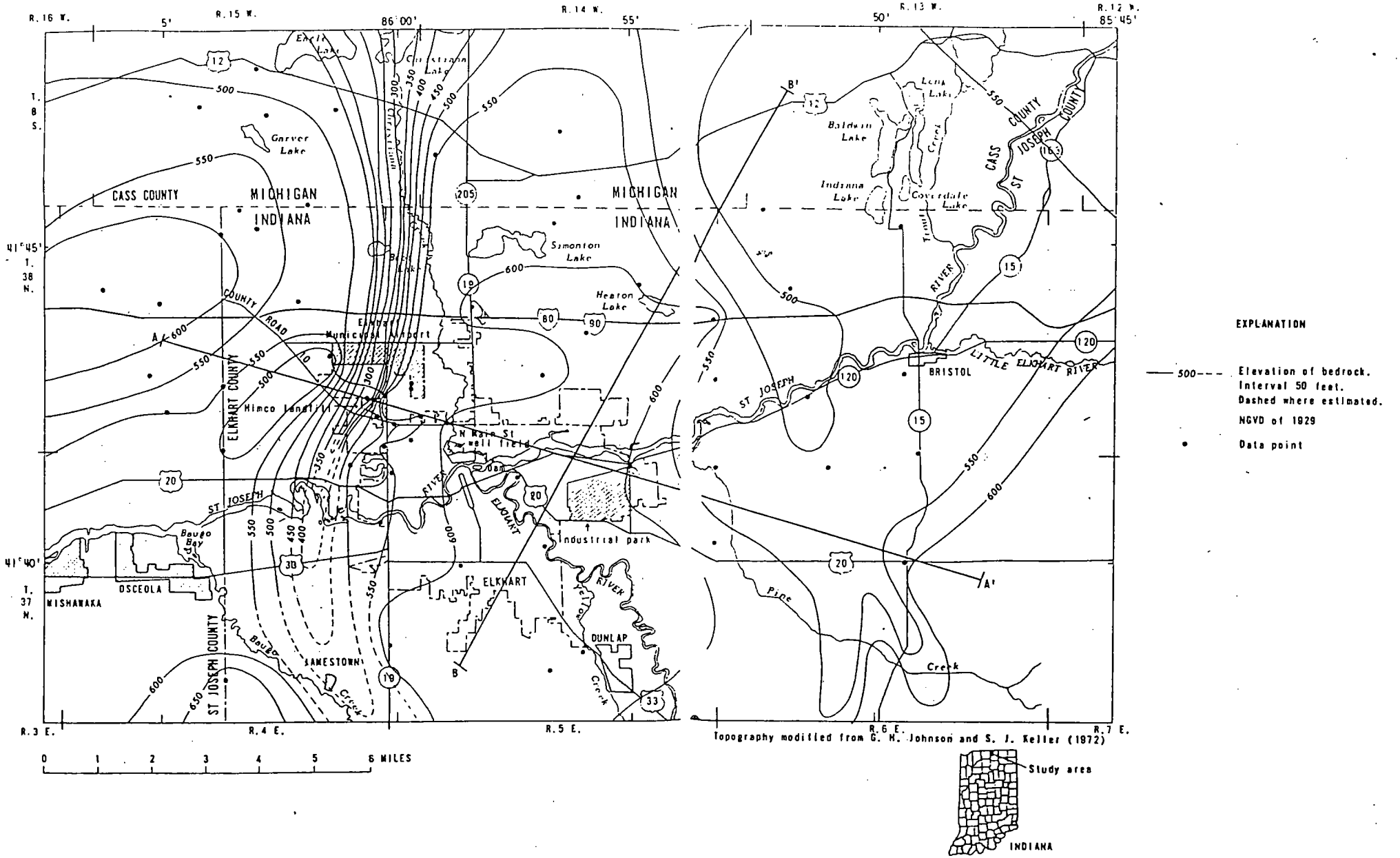


Figure 2.-- Surficial geology in parts of Elkhart and St. Joseph Counties, Ind., and Cass and St. Joseph Counties, Mich.



Topography modified from G. H. Johnson and S. J. Keller (1972)

Figure 3.-- Bedrock topography in parts of Elkhart and St. Joseph Counties, Ind., Cass and St. Joseph Counties, Mich.

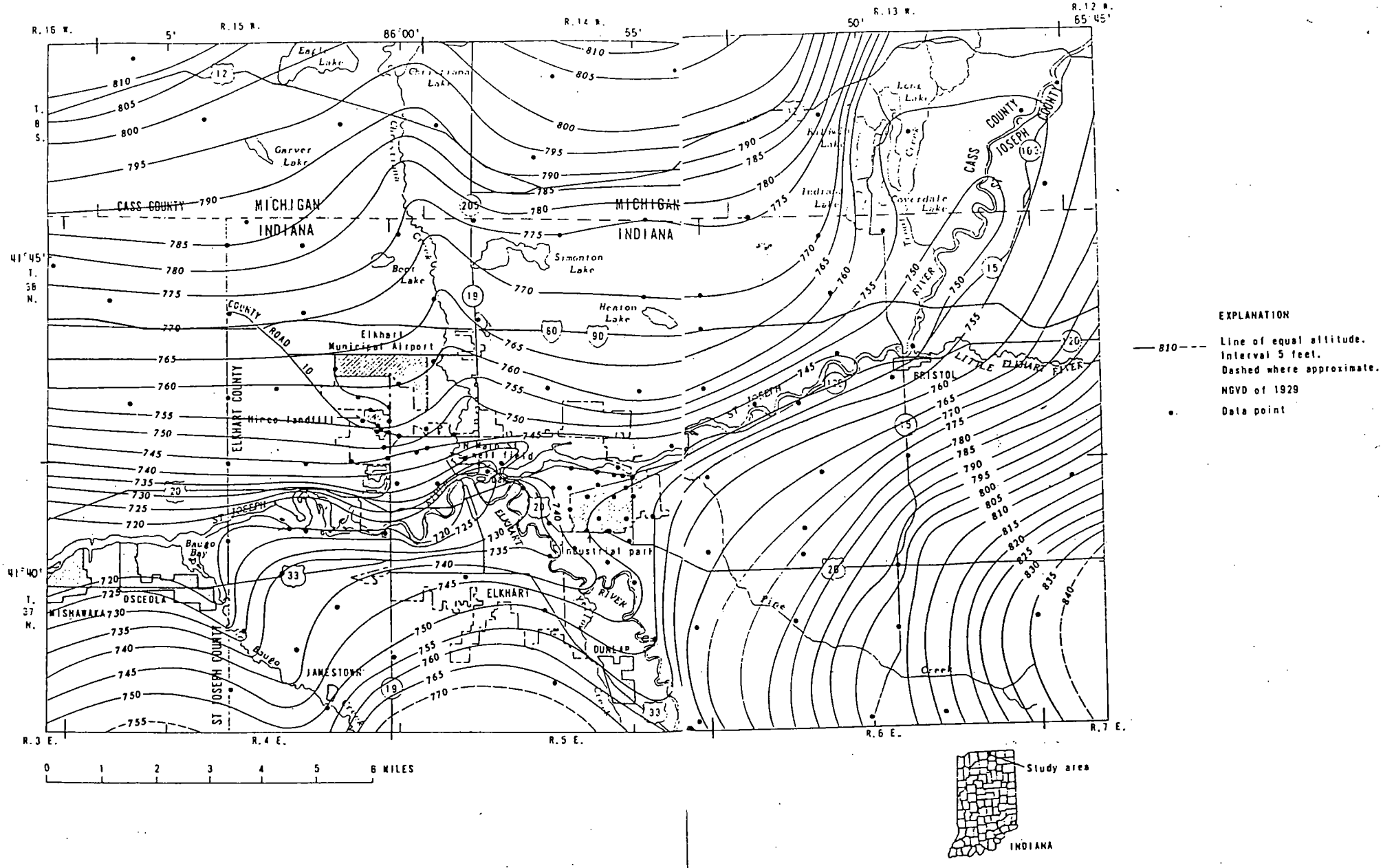


Figure 11.-- Water levels in the unconfined aquifer, May 1979.

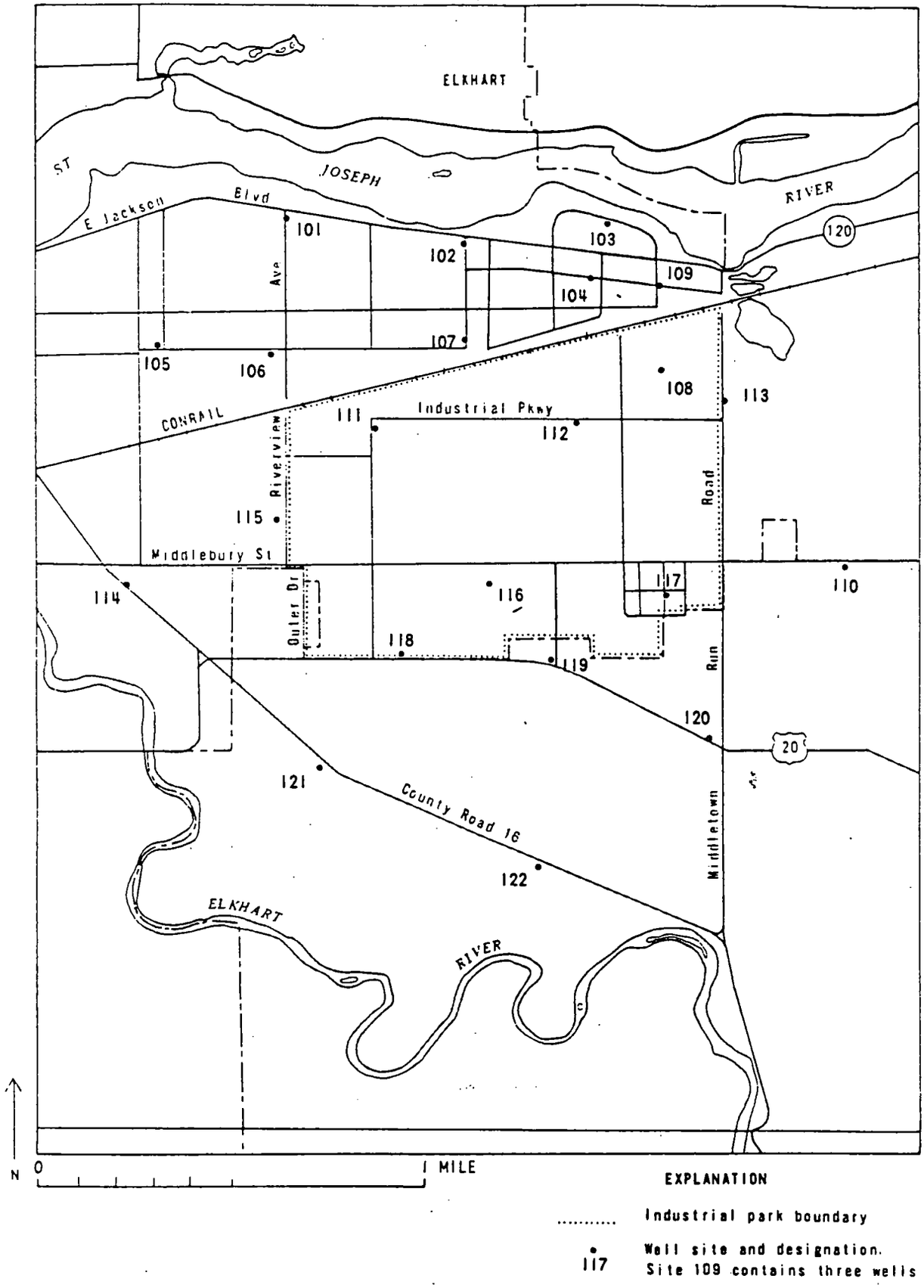


Figure 42.-- Sites of industrial-park wells sampled in 1978-79.

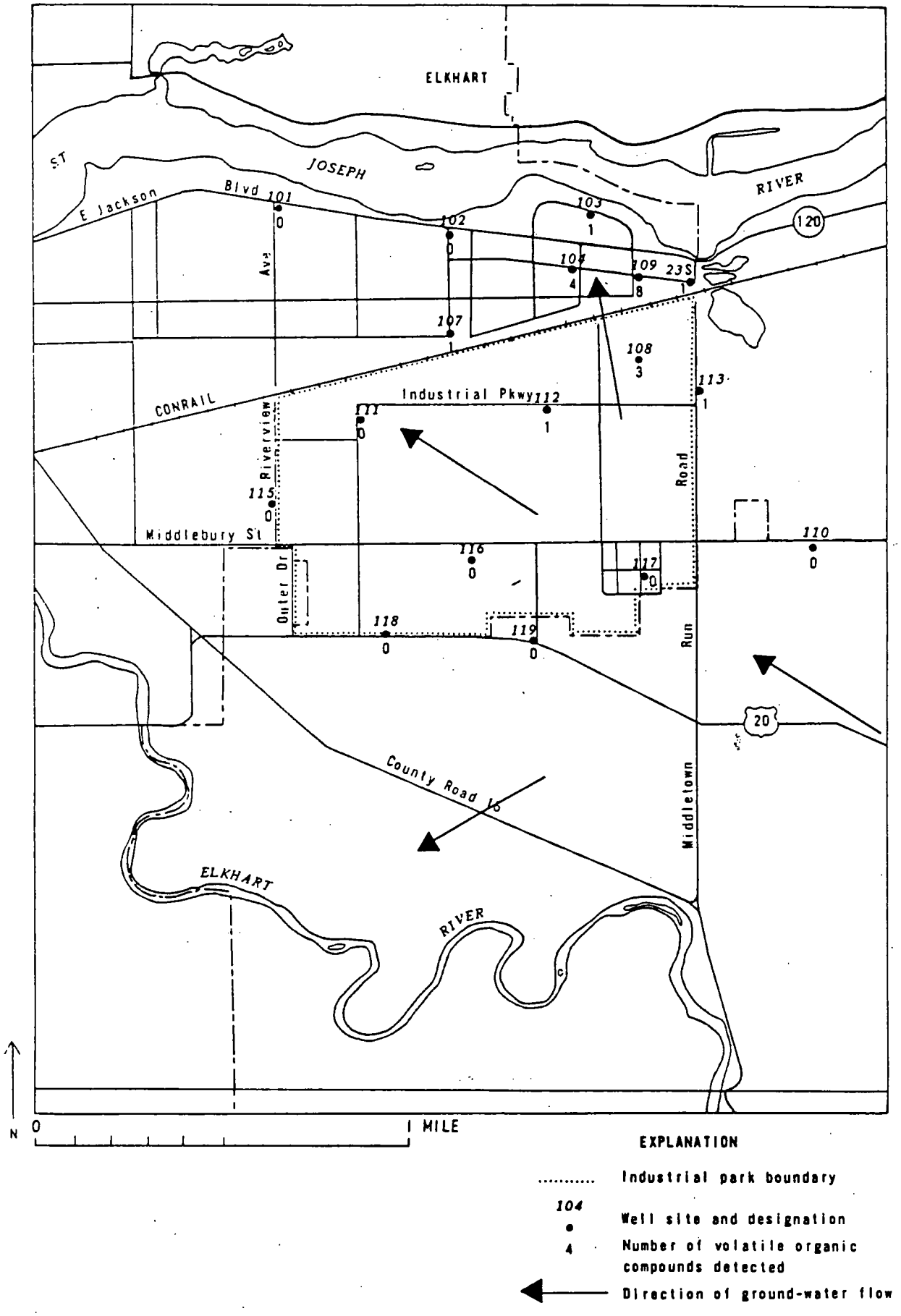


Figure 45.-- Areal extent of volatile organic compounds detected in industrial-park wells, 1979.

Table 1.

12/80 - 9/81 Water levels in Elkhart Industrial Park Wells-obtained from USGS WRD, Indianapolis,IN , June 1989

Well #	Total depth ft	Water Level in feet above mean sea level Date: 12/2/80	5/11/81	9/16/81
101	26.27	741.34	741.39	741.27
102	23.52	742.12	742.44	742.44
103	26.05	741.98	742.27	742.14
104	25.87	742.66	743.15	743.31
105	25.33	740.12	740.78	740.66
106	26.11	741.02	741.49	741.72
107	24.98	742.75	744.05	743.90
108	26.70	743.93	735.82	744.95
109b	24.83	742.75	743.27	743.23
109g	26.35	742.76	743.29	743.18
109R	23.88	742.77	743.28	743.20
110	26.24	747.76	748.40	748.50
111	36.78	742.56	743.31	744.20
112	25.37	744.02	746.10	745.74
113	25.97	744.21	745.16	745.19
114	26.15	737.44	737.83	738.14
115	16.88	741.38	742.10	743.18
116	28.53	743.95	744.82	746.24
117	26.25	745.92	746.75	748.10
122	25.92	742.12		

Table 11.--Volatile-organic-compound determinations for the industrial-park wells, 1978-79

[All values are microgram per liter: top line is April 1979 sampling result: bottom line is September 1979 sampling result; ND, not determined; --, below detection limit]

Sites	Methylene chloride	Trichlorofluoromethane	Chloroform	1,1-Dichloroethane	1,1,1-Trichloroethane	Trichloroethylene	Toluene	1,2-Dichloropropane
101	--	--	--	--	--	--	--	ND
	ND	ND	ND	ND	ND	ND	ND	ND
102	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--
103	--	--	--	--	87	--	--	ND
	--	--	--	--	52	--	--	--
104	51	--	--	37	1,160	358	--	ND
	--	--	--	--	606	459	--	--
107	--	--	--	--	--	82	--	ND
	--	--	--	--	--	364	--	--
108	31	--	--	--	31	17	--	ND
	--	--	--	--	18	29	--	--
109A	1,819	126	49	513	220	--	--	ND
	76	--	--	221	193	15	--	--
109B	4,400	113	--	850	156	--	--	ND
	794	--	--	--	81	--	--	424
109C	430	77	4	120	176	--	11	ND
	181	15	--	--	214	22	724	855
110	--	--	--	--	--	--	--	ND
	--	--	--	--	--	--	--	--
111	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--
112	--	--	--	--	--	40	--	ND
	--	--	--	--	--	531	--	--
113	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	315	--	--
115	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--
116	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--
117	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--
118	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--
119	ND	ND	ND	ND	ND	ND	ND	ND
	--	--	--	--	--	--	--	--
23S	--	--	--	--	--	--	--	ND
	--	--	--	--	--	--	7	--
Percent analytical recoveries	71	70	ND	ND	87	100	ND	ND